

SEQUENCE LISTING

<110> KYOWA HAKKO KOGYO CO., LTD

<120> Humanized anti-GD3 antibody and it's cytokine conjugate

<130>11239WO1

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<141>

<150>H11-278291

<151>1999-09-30

<160> 57

<170> PatentIn Ver. 2.0

<210> 1

<211> 138

<212> PRT

<213> Mus musculus

<400> 1

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Val Gln Cys Glu Val Thr Leu Val Glu Ser Gly Gly Asp Phe Val Lys
-1 1 5 10

Pro Gly Gly Ser Leu Lys Val Ser Cys Ala Ala Ser Gly Phe Ala Phe
15 20 25

Ser His Tyr Ala Met Ser Trp Val Arg Gln Thr Pro Ala Lys Arg Leu
30 35 40 45

Glu Trp Val Ala Tyr Ile Ser Ser Gly Gly Ser Gly Thr Tyr Tyr Ser
50 55 60

Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn
65 70 75

Thr Leu Tyr Leu Gln Met Arg Ser Leu Arg Ser Glu Asp Ser Ala Met
80 85 90

Tyr Phe Cys Thr Arg Val Lys Leu Gly Thr Tyr Tyr Phe Asp Ser Trp
95 100 105

Gly Gln Gly Thr Thr Leu Thr Val Ser Ser
110 115

<210> 2

<211> 128
 <212> PRT
 <213> Mus musculus

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 Gly Thr Arg Cys Asp Ile Gln Met Thr Gln Thr Ala Ser Ser Leu Pro
 -1 1 5 10
 Ala Ser Leu Gly Asp Arg Val Thr Ile Ser Cys Ser Ala Ser Gln Asp
 15 20 25
 Ile Ser Asn Tyr Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly Thr Val
 30 35 40
 Lys Leu Leu Ile Phe Tyr Ser Ser Asn Leu His Ser Gly Val Pro Ser
 45 50 55 60
 Arg Phe Ser Gly Gly Gly Ser Gly Thr Asp Tyr Ser Leu Thr Ile Ser
 65 70 75
 Asn Leu Glu Pro Glu Asp Ile Ala Thr Tyr Phe Cys His Gln Tyr Ser
 80 85 90
 Lys Leu Pro Trp Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg
 95 100 105

<210> 3
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 <213> Mus musculus

<400> 3
 His Tyr Ala Met Ser
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<210> 4
 <211> 17
 <212> PRT
 <213> Mus musculus

<400> 4
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 1 5 10 15

<210> 5
 <211> 10
 <212> PRT
 <213> Mus musculus

<400> 5

Val Lys Leu Gly Thr Tyr Tyr Phe Asp Ser
 1 5 10

<210> 6
 <211> 11
 <212> PRT
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<400> 6
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<210> 7
 <211> 7
 <212> PRT
 <213> Mus musculus

<400> 7
 Tyr Ser Ser Asn Leu His Ser
 1 5

<210> 8
 <211> 9
 <212> PRT
 <213> Mus musculus

<400> 8
 His Gln Tyr Ser Lys Leu Pro Trp Thr
 1 5

<210> 9
 <211> 119
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:synthetic protein

<400> 9
 Glu Val Gln Leu Val Glu Ser Gly Gly Asp Phe Val Gln Pro Gly Gly
 1 5 10 15

Ser Leu Arg Val Ser Cys Ala Ala Ser Gly Phe Ala Phe Ser His Tyr
 20 25 30

Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
 35 40 45

Ala Tyr Ile Ser Ser Gly Gly Ser Gly Thr Tyr Tyr Ser Asp Ser Val
 50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr

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<210> 10
<211> 108
<212> PRT
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence:synthetic protein

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<400> 10
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
  1                      5                      10                      15
Asp Arg Val Thr Ile Thr Cys Ser Ala Ser Gln Asp Ile Ser Asn Tyr
          20                      25                      30
Leu Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
          35                      40                      45
Phe Tyr Ser Ser Asn Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly
          50                      55                      60
Gly Gly Ser Gly Thr Asp Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro
  65                      70                      75                      80
Glu Asp Phe Ala Thr Tyr Tyr Cys His Gln Tyr Ser Lys Leu Pro Trp
          85                      90                      95
Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys Arg
          100                      105

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<210> 11
<211> 95
<212> DNA
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence:synthetic DNA

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<400> 11
caggaaacag ctatgacgcg gccgccacca tggagtttgg gctcagctgg cttttttcttg 60
tcctttgtttt caaaggtggt cagtgtgagg tgcag                                     95
```



```
<400> 12
aaagcgaatc cagaggctgc acaggagact ctcagagacc cccccggctg tacaaagtct 60
cccccaagact ccaccagctg cacctcacac tgaacac                                     97
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<220>
<223> Description of Artificial Sequence:synthetic DNA

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<400> 13
gcagcctctg gattcgcttt cagtcattat gccatgtctt gggtcgcgca ggctccaggg 60
aagggggctgg agtgggtggc ttatattagt agtgggtgg 98
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<220>
<223> Description of Artificial Sequence:synthetic DNA

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<400> 14
gatacagcgt gttcttggag ttatctctgg agatggtgaa tctgcccttt acactgtctg 60
aatagtaggt gccactacca ccactactaa tataagc                                97
```

<220>
<223> Description of Artificial Sequence:synthetic DNA

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<400> 15
ctccaagaac acgctgtatc tgcaaatgcg cagcctgaga gctgaggact cggctgtgta 60
tttctgtaca agagttaaac tgggaaccta ctactttg                               98
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<210>	16
<211>	92
<212>	DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:synthetic DNA

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ggccccagga gtcaaagtag taggttccca gt 92

<210> 17

<211> 94

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:synthetic DNA

<400> 17

caggaaacag ctatgacgaa ttccaccatg atgtcctctg ctcagttcct tggctctctg 60
ttgctctgtt ttcaaggtac cagatgtgac atcc 94

<210> 18

<211> 87

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:synthetic DNA

<400> 18

gcactacaag tgatggtgac tctgtctcct acagatgcag acagggagga tggagactgg 60
gtcatctgga tgcacatct ggtacct 87

<210> 19

<211> 89

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:synthetic DNA

<400> 19

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aaaccaggga aagcccctaa gtcctgat 89

<210> 20

<211> 89

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:synthetic DNA

<400> 20
 taatctgtcc cagatccacc gccgctgaac cttgatggga ccccgagtg taaatttgat 60
 gagtaaaaga tcaggagctt aggggcttt 89

<210> 21
 <211> 92
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:synthetic DNA

<400> 21
 ggtggatctg ggacagatta tactctcacc atcagcagcc tgcagcctga agattttgca 60
 acttattact gtcacagta tagtaagctt cc 92

<210> 22
 <211> 80
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:synthetic DNA

<400> 22
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 ggaagcttac tatactgatg 80

<210> 23
 <211> 45
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:synthetic DNA

<400> 23
 agcttccatg gacgttcggt ggaggcacca agctggaaat caaac 45

<210> 24
 <211> 45
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:synthetic DNA

<400> 24
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agg ttc agc ggc ggt gga tct ggg aca gat tat act ctc acc atc agc 288
Arg Phe Ser Gly Gly Gly Ser Gly Thr Asp Tyr Thr Leu Thr Ile Ser
65 70 75

agc ctg cag cct gaa gat ttt gca act tat tac tgt cat cag tat agt 336
Ser Leu Gln Pro Glu Asp Phe Ala Thr Tyr Tyr Cys His Gln Tyr Ser
80 85 90

aag ctt ccg tgg acg ttc ggc cag ggg acc aag gta gag att aaa cgt 384
Lys Leu Pro Trp Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys Arg
95 100 105

<210> 28
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:synthetic DNA

<400> 28
actgatgaca gaaataagtt gcaaaa 26

<210> 29
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:synthetic DNA

<400> 29
ttttgcaact tatttctgtc atcagt 26

<210> 30
<211> 384
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:synthetic DNA

<220>
<221> CDS
<222> (1)..(384)

<400> 30
atg atg tcc tct gct cag ttc ctt ggt ctc ctg ttg ctc tgt ttt caa 48
Met Met Ser Ser Ala Gln Phe Leu Gly Leu Leu Leu Cys Phe Gln
-20 -15 -10 -5

ggc acc aga tgt gac atc cag atg acc cag tct cca tcc tcc ctg tct 96

(Faint musical notation)

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<210> 31
<211> 28
<212> DNA
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence:synthetic DNA

<400> 31
ggagcttaac ggctttgtct ggtttctg 28

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<210> 32
<211> 28
<212> DNA
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence:synthetic DNA

<400> 32
cagaaaccag acaaagccgt taagctcc 28

<210>	33
<211>	384
<212>	DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:synthetic DNA

<220>

<221> CDS

<222> (1)..(384)

<400> 33

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Met	Met	Ser	Ser	Ala	Gln	Phe	Leu	Gly	Leu	Leu	Leu	Leu	Cys	Phe	Gln	
-20				-15				-10					-5			

ggt	acc	aga	tgt	gac	atc	cag	atg	acc	cag	tct	cca	tcc	tcc	ctg	tct	96
Gly	Thr	Arg	Cys	Asp	Ile	Gln	Met	Thr	Gln	Ser	Pro	Ser	Ser	Leu	Ser	
	-1		1					5					10			

gca	tct	gta	gga	gac	aga	gtc	acc	atc	act	tgt	agt	gca	agt	cag	gac	144
Ala	Ser	Val	Gly	Asp	Arg	Val	Thr	Ile	Thr	Cys	Ser	Ala	Ser	Gln	Asp	
	15					20						25				

att	agt	aat	tat	tta	aac	tgg	tat	cag	cag	aaa	cca	gac	aaa	gcc	gtt	192
Ile	Ser	Asn	Tyr	Leu	Asn	Trp	Tyr	Gln	Gln	Lys	Pro	Asp	Lys	Ala	Val	
	30					35					40					

aag	ctc	ctg	atc	ttt	tac	tca	tca	aat	tta	cac	tcg	ggg	gtc	cca	tca	240
Lys	Leu	Leu	Ile	Phe	Tyr	Ser	Ser	Asn	Leu	His	Ser	Gly	Val	Pro	Ser	
45				50				55					60			

agg	ttc	agc	ggc	ggt	gga	tct	ggg	aca	gat	tat	act	ctc	acc	atc	agc	288
Arg	Phe	Ser	Gly	Gly	Gly	Ser	Gly	Thr	Asp	Tyr	Thr	Leu	Thr	Ile	Ser	
			65					70						75		

agc	ctg	cag	cct	gaa	gat	ttt	gca	act	tat	tac	tgt	cat	cag	tat	agt	336
Ser	Leu	Gln	Pro	Glu	Asp	Phe	Ala	Thr	Tyr	Tyr	Cys	His	Gln	Tyr	Ser	
			80					85					90			

aag	ctt	ccg	tgg	acg	ttc	ggc	cag	ggg	acc	aag	gta	gag	att	aaa	cgt	384
Lys	Leu	Pro	Trp	Thr	Phe	Gly	Gln	Gly	Thr	Lys	Val	Glu	Ile	Lys	Arg	
	95						100					105				

<210> 34

<211> 48

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:synthetic DNA

<400> 34

gttgcgatat	cttcaggctg	cagattgctg	atggtgagac	tataatct	48
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<210> 35

<400> 36																	
atg	atg	tcc	tct	gct	cag	ttc	ctt	ggc	ctc	ctg	ttg	ctc	tgt	ttt	caa	48	
Met	Met	Ser	Ser	Ala	Gln	Phe	Leu	Gly	Leu	Leu	Leu	Leu	Cys	Phe	Gln		
					-15						-10					-5	
ggc	acc	aga	tgt	gac	atc	cag	atg	acc	cag	tct	cca	tcc	tcc	ctg	tct	96	
Gly	Thr	Arg	Cys	Asp	Ile	Gln	Met	Thr	Gln	Ser	Pro	Ser	Ser	Leu	Ser		
				-1	1			5					10				
gca	tct	gta	gga	gac	aga	gtc	acc	atc	act	tgt	agt	gca	agt	cag	gac	144	
Ala	Ser	Val	Gly	Asp	Arg	Val	Thr	Ile	Thr	Cys	Ser	Ala	Ser	Gln	Asp		
		15				20						25					
att	agt	aat	tat	tta	aac	tgg	tat	cag	cag	aaa	cca	ggg	aaa	gcc	cct	192	
Ile	Ser	Asn	Tyr	Leu	Asn	Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Lys	Ala	Pro		
30						35				40							
aag	ctc	ctg	atc	ttt	tac	tca	tca	aat	tta	cac	tgc	ggg	gtc	cca	tca	240	
Lys	Leu	Leu	Ile	Phe	Tyr	Ser	Ser	Asn	Leu	His	Ser	Gly	Val	Pro	Ser		
45					50				55						60		
agg	ttc	agc	ggc	ggc	gga	tct	ggg	aca	gat	tat	agt	ctc	acc	atc	agc	288	
Arg	Phe	Ser	Gly	Gly	Gly	Ser	Gly	Thr	Asp	Tyr	Ser	Leu	Thr	Ile	Ser		
				65				70						75			
aat	ctg	cag	cct	gaa	gat	atc	gca	act	tat	tac	tgt	cat	cag	tat	agt	336	
Asn	Leu	Gln	Pro	Glu	Asp	Ile	Ala	Thr	Tyr	Tyr	Cys	His	Gln	Tyr	Ser		
				80				85				90					
aag	ctt	ccg	tgg	acg	ttc	ggc	cag	ggg	acc	aag	gta	gag	att	aaa	cgt	384	
Lys	Leu	Pro	Trp	Thr	Phe	Gly	Gln	Gly	Thr	Lys	Val	Glu	Ile	Lys	Arg		
		95				100						105					

<210> 37
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:synthetic DNA

<400> 37
 ttcaggctgc agattgctga tgggtg 25

<210> 38
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:synthetic DNA

<400> 38
 caccatcagc aatctgcagc ctgaa 25

<210> 39
 <211> 384
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:synthetic DNA

<220>

<221> CDS

<222> (1)..(384)

<400> 39
 atg atg tcc tct gct cag ttc ctt ggt ctc ctg ttg ctc tgt ttt caa 48
 Met Met Ser Ser Ala Gln Phe Leu Gly Leu Leu Leu Cys Phe Gln
 -20 -15 -10 -5

ggt acc aga tgt gac atc cag atg acc cag tct cca tcc tcc ctg tct 96
 Gly Thr Arg Cys Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser
 -1 1 5 10

gca tct gta gga gac aga gtc acc atc act tgt agt gca agt cag gac 144
 Ala Ser Val Gly Asp Arg Val Thr Ile Thr Cys Ser Ala Ser Gln Asp
 15 20 25

att agt aat tat tta aac tgg tat cag cag aaa cca ggg aaa gcc cct 192
 Ile Ser Asn Tyr Leu Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro
 30 35 40

aag ctc ctg atc ttt tac tca tca aat tta cac tcg ggg gtc cca tca 240
 Lys Leu Leu Ile Phe Tyr Ser Ser Asn Leu His Ser Gly Val Pro Ser
 45 50 55 60

agg ttc agc ggc ggt gga tct ggg aca gat tat act ctc acc atc agc 288
Arg Phe Ser Gly Gly Ser Gly Thr Asp Tyr Thr Leu Thr Ile Ser
65 70 75

aat ctg cag cct gaa gat ttt gca act tat tac tgt cat cag tat agt 336
Asn Leu Gln Pro Glu Asp Phe Ala Thr Tyr Tyr Cys His Gln Tyr Ser
80 85 90

aag ctt ccg tgg acg ttc ggc cag ggg acc aag gta gag att aaa cgt 384
Lys Leu Pro Trp Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys Arg
95 100 105

<210> 40
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:synthetic DNA

<400> 40
gacagaaata agttgcgata tcttcaggct 30

<210> 41
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:synthetic DNA

<400> 41
agcctgaaga tatcgcaact tatttctgtc 30

<210> 42
<211> 384
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:synthetic DNA

<220>
<221> CDS
<222> (1)..(384)

<400> 42
atg atg tcc tct gct cag ttc ctt ggt ctc ctg ttg ctc tgt ttt caa 48
Met Met Ser Ser Ala Gln Phe Leu Gly Leu Leu Leu Cys Phe Gln
-20 -15 -10 -5

ggc acc aga tgt gac atc cag atg acc cag tct cca tcc tcc ctg tct 96

Gly	Thr	Arg	Cys	Asp	Ile	Gln	Met	Thr	Gln	Ser	Pro	Ser	Ser	Leu	Ser	
		-1	1					5					10			
gca	tct	gta	gga	gac	aga	gtc	acc	atc	act	tgt	agt	gca	agt	cag	gac	144
Ala	Ser	Val	Gly	Asp	Arg	Val	Thr	Ile	Thr	Cys	Ser	Ala	Ser	Gln	Asp	
		15					20				25					
att	agt	aat	tat	tta	aac	tgg	tat	cag	cag	aaa	cca	ggg	aaa	gcc	cct	192
Ile	Ser	Asn	Tyr	Leu	Asn	Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Lys	Ala	Pro	
		30				35					40					
aag	ctc	ctg	atc	ttt	tac	tca	tca	aat	tta	cac	tcg	ggg	gtc	cca	tca	240
Lys	Leu	Leu	Ile	Phe	Tyr	Ser	Ser	Asn	Leu	His	Ser	Gly	Val	Pro	Ser	
		45			50					55				60		
agg	ttc	agc	ggc	ggt	gga	tct	ggg	aca	gat	tat	act	ctc	acc	atc	agc	288
Arg	Phe	Ser	Gly	Gly	Gly	Ser	Gly	Thr	Asp	Tyr	Thr	Leu	Thr	Ile	Ser	
			65					70						75		
agc	ctg	cag	cct	gaa	gat	atc	gca	act	tat	ttc	tgt	cat	cag	tat	agt	336
Ser	Leu	Gln	Pro	Glu	Asp	Ile	Ala	Thr	Tyr	Phe	Cys	His	Gln	Tyr	Ser	
			80					85					90			
aag	ctt	ccg	tgg	acg	ttc	ggc	cag	ggg	acc	aag	gta	gag	att	aaa	cgt	384
Lys	Leu	Pro	Trp	Thr	Phe	Gly	Gln	Gly	Thr	Lys	Val	Glu	Ile	Lys	Arg	
		95					100					105				

<210> 43
 <211> 87
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:synthetic DNA

<400> 43
 gcactacaag tgaagggtgac tctgtctcct acagatgcag gcagggagga tgcagactgg 60
 gtcactctgga tgcacatct ggtacct 87

<210> 44
 <211> 89
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:synthetic DNA

<400> 44
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 aaaccaggga aagccggttaa gctcctgat 89

<210> 45
 <211> 89

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:synthetic DNA

<400> 45

taatctgtcc cagatccacc gccgctgaac cttgatggga cccccgagtg taaatttgat 60
gagtaaaaga tcaggagctt aacggcttt 89

<210> 46

<211> 92

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:synthetic DNA

<400> 46

ggtggatctg ggacagatta tactctcacc atcagcagcc tgcagcctga agattttgca 60
acttatttct gtcacagta tagtaagctt cc 92

<210> 47

<211> 384

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:synthetic DNA

<220>

<221> CDS

<222> (1)..(384)

<400> 47

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Met Met Ser Ser Ala Gln Phe Leu Gly Leu Leu Leu Leu Cys Phe Gln
-20 -15 -10 -5

ggt acc aga tgt gac atc cag atg acc cag tct gca tcc tcc ctg cct 96
Gly Thr Arg Cys Asp Ile Gln Met Thr Gln Ser Ala Ser Ser Leu Pro
-1 1 5 10

gca tct gta gga gac aga gtc acc atc act tgt agt gca agt cag gac 144
Ala Ser Val Gly Asp Arg Val Thr Ile Thr Cys Ser Ala Ser Gln Asp
15 20 25

att agt aat tat tta aac tgg tat cag cag aaa cca ggg aaa gcc gtt 192
Ile Ser Asn Tyr Leu Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala Val
30 35 40

aag ctc ctg atc ttt tac tca tca aat tta cac tcg ggg gtc cca tca 240
Lys Leu Leu Ile Phe Tyr Ser Ser Asn Leu His Ser Gly Val Pro Ser
45 50 55 60

agg ttc agc ggc ggt gga tct ggg aca gat tat act ctc acc atc agc 288
Arg Phe Ser Gly Gly Gly Ser Gly Thr Asp Tyr Thr Leu Thr Ile Ser
65 70 75

agc ctg cag cct gaa gat ttt gca act tat ttc tgt cat cag tat agt 336
Ser Leu Gln Pro Glu Asp Phe Ala Thr Tyr Phe Cys His Gln Tyr Ser
80 85 90

aag ctt ccg tgg acg ttc ggc cag ggg acc aag gta gag att aaa cgt 384
Lys Leu Pro Trp Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys Arg
95 100 105

<210> 48

<211> 384

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:synthetic DNA

<220>

<221> CDS

<222> (1)..(384)

<400> 48

atg atg tcc tct gct cag ttc ctt ggt ctc ctg ttg ctc tgt ttt caa 48
Met Met Ser Ser Ala Gln Phe Leu Gly Leu Leu Leu Cys Phe Gln
-20 -15 -10 -5

ggc acc aga tgt gac atc cag atg acc cag tct cca tcc tcc ctg tct 96
Gly Thr Arg Cys Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser
-1 1 5 10

gca tct gta gga gac aga gtc acc atc act tgt agt gca agt cag gac 144
Ala Ser Val Gly Asp Arg Val Thr Ile Thr Cys Ser Ala Ser Gln Asp
15 20 25

att agt aat tat tta aac tgg tat cag cag aaa cca gac aaa gcc gtt 192
Ile Ser Asn Tyr Leu Asn Trp Tyr Gln Gln Lys Pro Asp Lys Ala Val
30 35 40

aag ctc ctg atc ttt tac tca tca aat tta cac tcg ggc gtc cca tca 240
Lys Leu Leu Ile Phe Tyr Ser Ser Asn Leu His Ser Gly Val Pro Ser
45 50 55 60

agg ttc agc ggc ggt gga tct ggg aca gat tat act ctc acc atc agc 288
Arg Phe Ser Gly Gly Gly Ser Gly Thr Asp Tyr Thr Leu Thr Ile Ser
65 70 75

agc ctg cag cct gaa gat atc gca act tat ttc tgt cat cag tat agt 336
Ser Leu Gln Pro Glu Asp Ile Ala Thr Tyr Phe Cys His Gln Tyr Ser
80 85 90

aag ctt ccg tgg acg ttc ggc cag ggg acc aag gta gag att aaa cgt 384

Lys Leu Pro Trp Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys Arg
 95 100 105

<210> 49
 <211> 76
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:synthetic DNA

<400> 49
 catgcatgag gctctgcaca accactacac gcagaagagc ctctccctgt ctcccggggg 60
 agaattcatt gatcag 76

<210> 50
 <211> 85
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:synthetic DNA

<400> 50
 gatcctgatc aatgaattct cccccgggag acagggagag gctcttctgc gtgtagtggt 60
 tgtgcagagc ctcatgcatg gggcc 85

<210> 51
 <211> 37
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:synthetic DNA

<400> 51
 gtctcccgga aaagcaccta ctagtagttc tacaaag 37

<210> 52
 <211> 38
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:synthetic DNA

<400> 52
 ccctgatcaa tgaattcaag tcagtgttga gatgatgc 38

<210> 53

<211> 582

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:synthetic protein

<400> 53

Glu Val Gln Leu Val Glu Ser Gly Gly Asp Phe Val Gln Pro Gly Gly
1 5 10 15

Ser Leu Arg Val Ser Cys Ala Ala Ser Gly Phe Ala Phe Ser His Tyr
20 25 30

Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

Ala Tyr Ile Ser Ser Gly Gly Ser Gly Thr Tyr Tyr Ser Asp Ser Val
50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr
65 70 75 80

Leu Gln Met Arg Ser Leu Arg Ala Glu Asp Ser Ala Val Tyr Phe Cys
85 90 95

Thr Arg Val Lys Leu Gly Thr Tyr Tyr Phe Asp Ser Trp Gly Gln Gly
100 105 110

Thr Leu Leu Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe
115 120 125

Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu
130 135 140

Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp
145 150 155 160

Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu
165 170 175

Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser
180 185 190

Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro
195 200 205

Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys
210 215 220

Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro
225 230 235 240

Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser
245 250 255

Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp

260	265	270
Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn		
275	280	285
Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val		
290	295	300
Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu		
305	310	315
Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys		
325	330	335
Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr		
340	345	350
Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr		
355	360	365
Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu		
370	375	380
Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu		
385	390	395
Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys		
405	410	415
Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu		
420	425	430
Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly		
435	440	445
Lys Ala Pro Thr Ser Ser Ser Thr Lys Lys Thr Gln Leu Gln Leu Glu		
450	455	460
His Leu Leu Leu Asp Leu Gln Met Ile Leu Asn Gly Ile Asn Asn Tyr		
465	470	475
Lys Asn Pro Lys Leu Thr Arg Met Leu Thr Phe Lys Phe Tyr Met Pro		
485	490	495
Lys Lys Ala Thr Glu Leu Lys His Leu Gln Cys Leu Glu Glu Glu Leu		
500	505	510
Lys Pro Leu Glu Glu Val Leu Asn Leu Ala Gln Ser Lys Asn Phe His		
515	520	525
Leu Arg Pro Arg Asp Leu Ile Ser Asn Ile Asn Val Ile Val Leu Glu		
530	535	540
Leu Lys Gly Ser Glu Thr Thr Phe Met Cys Glu Tyr Ala Asp Glu Thr		
545	550	555
Ala Thr Ile Val Glu Phe Leu Asn Arg Trp Ile Thr Phe Cys Gln Ser		

575

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<400> 55
Glu Val Thr Leu Val Glu Ser Gly Gly Asp Phe Val Lys Pro Gly Gly
  1             5             10             15
Ser Leu Lys Val Ser Cys Ala Ala Ser Gly Phe Ala Phe Ser His Tyr
      20             25             30
Ala Met Ser Trp Val Arg Gln Thr Pro Ala Lys Arg Leu Glu Trp Val
      35             40             45
Ala Tyr Ile Ser Ser Gly Gly Ser Gly Thr Tyr Tyr Ser Asp Ser Val
      50             55             60
Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Thr Leu Tyr
      65             70             75             80

```

Leu Gln Met Arg Ser Leu Arg Ser Glu Asp Ser Ala Met Tyr Phe Cys
85 90 95

Thr Arg Val Lys Leu Gly Thr Tyr Tyr Phe Asp Ser Trp Gly Gln Gly
100 105 110

Thr Thr Leu Thr Val Ser Ser
115

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<210> 56
<211> 108
<212> PRT
<213> Mus musculus
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<400> 56
Asp Ile Gln Met Thr Gln Thr Ala Ser Ser Leu Pro Ala Ser Leu Gly
1 5 10 15

Asp Arg Val Thr Ile Ser Cys Ser Ala Ser Gln Asp Ile Ser Asn Tyr
20 25 30

Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly Thr Val Lys Leu Leu Ile
35 40 45

Phe Tyr Ser Ser Asn Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Gly Gly Ser Gly Thr Asp Tyr Ser Leu Thr Ile Ser Asn Leu Glu Pro
65 70 75 80

Glu Asp Ile Ala Thr Tyr Phe Cys His Gln Tyr Ser Lys Leu Pro Trp
85 90 95

Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg
100 105

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<210> 57
<211> 582
<212> PRT
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence:synthetic protein
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<400> 57
Glu Val Thr Leu Val Glu Ser Gly Gly Asp Phe Val Lys Pro Gly Gly
1 5 10 15

Ser Leu Lys Val Ser Cys Ala Ala Ser Gly Phe Ala Phe Ser His Tyr
20 25 30

Ala Met Ser Trp Val Arg Gln Thr Pro Ala Lys Arg Leu Glu Trp Val
35 40 45

Ala Tyr Ile Ser Ser Gly Gly Ser Gly Thr Tyr Tyr Ser Asp Ser Val

50					55					60					
Lys	Gly	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asn	Ala	Lys	Asn	Thr	Leu	Tyr
65					70					75					80
Leu	Gln	Met	Arg	Ser	Leu	Arg	Ser	Glu	Asp	Ser	Ala	Met	Tyr	Phe	Cys
				85					90					95	
Thr	Arg	Val	Lys	Leu	Gly	Thr	Tyr	Tyr	Phe	Asp	Ser	Trp	Gly	Gln	Gly
			100					105					110		
Thr	Thr	Leu	Thr	Val	Ser	Ser	Ala	Ser	Thr	Lys	Gly	Pro	Ser	Val	Phe
			115				120					125			
Pro	Leu	Ala	Pro	Ser	Ser	Lys	Ser	Thr	Ser	Gly	Gly	Thr	Ala	Ala	Leu
			130			135					140				
Gly	Cys	Leu	Val	Lys	Asp	Tyr	Phe	Pro	Glu	Pro	Val	Thr	Val	Ser	Trp
145				150						155					160
Asn	Ser	Gly	Ala	Leu	Thr	Ser	Gly	Val	His	Thr	Phe	Pro	Ala	Val	Leu
				165					170					175	
Gln	Ser	Ser	Gly	Leu	Tyr	Ser	Leu	Ser	Ser	Val	Val	Thr	Val	Pro	Ser
			180					185					190		
Ser	Ser	Leu	Gly	Thr	Gln	Thr	Tyr	Ile	Cys	Asn	Val	Asn	His	Lys	Pro
			195				200					205			
Ser	Asn	Thr	Lys	Val	Asp	Lys	Lys	Val	Glu	Pro	Lys	Ser	Cys	Asp	Lys
			210			215					220				
Thr	His	Thr	Cys	Pro	Pro	Cys	Pro	Ala	Pro	Glu	Leu	Leu	Gly	Gly	Pro
225				230						235					240
Ser	Val	Phe	Leu	Phe	Pro	Pro	Lys	Pro	Lys	Asp	Thr	Leu	Met	Ile	Ser
				245					250					255	
Arg	Thr	Pro	Glu	Val	Thr	Cys	Val	Val	Val	Asp	Val	Ser	His	Glu	Asp
			260					265					270		
Pro	Glu	Val	Lys	Phe	Asn	Trp	Tyr	Val	Asp	Gly	Val	Glu	Val	His	Asn
			275				280					285			
Ala	Lys	Thr	Lys	Pro	Arg	Glu	Glu	Gln	Tyr	Asn	Ser	Thr	Tyr	Arg	Val
			290			295					300				
Val	Ser	Val	Leu	Thr	Val	Leu	His	Gln	Asp	Trp	Leu	Asn	Gly	Lys	Glu
305				310					315					320	
Tyr	Lys	Cys	Lys	Val	Ser	Asn	Lys	Ala	Leu	Pro	Ala	Pro	Ile	Glu	Lys
				325				330						335	
Thr	Ile	Ser	Lys	Ala	Lys	Gly	Gln	Pro	Arg	Glu	Pro	Gln	Val	Tyr	Thr
			340					345					350		
Leu	Pro	Pro	Ser	Arg	Asp	Glu	Leu	Thr	Lys	Asn	Gln	Val	Ser	Leu	Thr

